The Builder.

SATURDAY, OCTOBER 9, 1852.

"YOU say, in your last record of electro-telegraphic progress—and a wonderful progress it is,—that "twenty-five miles of wire for one of the Irish lines were encased with *gutta percha* in the usual way." Now, I wish you would tell us something more about this, and of the manipulation generally of gutta percha. Thus writes to us an inquirer; and as we are always willing to afford readers the information they desire when we can do so conveniently and it is likely to interest others, we made a journey to the works of the Gutta Percha Company in that far distant part of this never-ending, still-beginning metropolis, this ten-times-Babylon, called the City-road. Well may strangers ask, where does London end? A satisfactory reply can scarcely be given.

It ought to be almost too late now for us to give any information about gutta percha; but the truth is, the public is not curious: the many-headed monster is contented to wait till he finds the information is in his head—he knows not how nor cares; and many of the present generation will go down to their quiet graves without any other knowledge of this extraordinary material than that it is something like India-rubber, and serves to keep their feet dry. The majority of our readers, however, know perfectly well that the tree from which it is obtained, and there is but one, grows scarcely anywhere but in the Malayan Archipelago, and that until Dr. Montgomerie noticed the native use of it in 1842, and, together with Dr. D'Almeida, forced it upon the attention of the London manufacturers in 1843, it was unknown here. In 1845 we imported only 20,600 lbs. but in 1848 the quantity brought in amounted to 3,000,000 lbs.* and, since then, it has been constantly increasing, and, if it can be had, will continue to increase. Even now we see it in use in the shape of mill-bands, buckets, sailors' hats, buoys, speaking-trumpets, tables, baskets, picture-frames, moulded decorations of all sorts, pumps and bottles for acids, pipes for water and gas, soles for boots, hats, snuff-boxes, whips, skate-bottoms, bottles, breasts of water-wheels, dressings for wounds, sash-cord, waterproof cloth, even toothed wheels, and a hundred other things. And these we are satisfied are as nothing compared with the uses to which it will be applied hereafter. In fact, you may make anything of it but bread and cheese, and even of these you could get from it such an imitation as would serve the eye, though the gastric-juice would find it difficult to work upon. Some of the lumps in which it reaches this country are not unlike flattened cheeses, double-Glo'ster, for example: others are like cocoa-nuts in their rough shells; and the first step taken with it is to bring these within the action of a vertical wheel, with knives fixed on the face of it, which, revolving rapidly, cut the material into thin slices, and often expose the progress of the Malays towards the deceits of civilization, in the shape of lumps of wood encased, to increase the apparent quantity. The mode of obtaining gutta percha, we may say here, is most wasteful: instead of tapping the trees at intervals to obtain the sap, the trees are cut down, so that, unless their artificial cultivation be taken up by civilized people, the supply will soon be shortened. Dr. Oxley,* who wrote in Singapore, whence all that we get at present comes, says, that for the quantity which was exported between January 1st, 1845, and July, 1847, nearly 70,000 trees must have been destroyed!

When it has been sliced, as we said, it is boiled in coppers, forced into a hopper, where serrated knives tear it into shreds; and it is washed in various waters, in the course of which the foreign matter sinks to the bottom and is removed, while the gutta percha floats. Being cleansed, and this is of great consequence, especially for covering telegraph wires, the material is put between rollers, which partly squeeze out the moisture, and it is then placed in a kneading machine, and, ultimately is passed through rollers to form sheets and bands, or submitted to the drawing-mill to be formed into cords or pipes. At the temperature of boiling-water it becomes soft, will take any form or the finest impression, and at the ordinary temperature regains the consistence of leather.

Herein lies, as may be seen at once, its extraordinary value. Combined with sulphur, it may be made as hard as ebony, too, but this is not the condition in which it is most useful. For pipe-making and for covering telegraphic wires a further cleansing process is gone through: it is driven by immense pressure, the pressure of four hydraulic pumps, through gauze wire and very fine holes in a steel plate, and it is rolled and kneaded again. To make pipe the softened material is forced through a die, the pipe as it forms being drawn away from the die through water to harden it. The mode of joining the pipes is very simple and beautiful, hot water and a little skill being all that is needed.

There seems good reason to believe that piping of this material will be very extensively used. The testimonials in favour of its use for conveying water and other fluids are numerous and strong, although necessarily the experience is comparatively short. We regard it as of the utmost importance that the fact of its endurance should be established, as, that being proved, we shall then be able to get rid of the noxious lead-piping through which water now flows to our dwellings, and the, still worse, lead-lined cisterns. The ability to make pipes in very long lengths, too, will be valuable in many cases, as, for instance, when it is necessary to lay pipes under water. To convey the Croton water to Blackwell's Island, New York, a distance of 1,000 feet, the pipe was made of gutta percha in *one length*, and, by means of a line of boats, was lowered into its place—with small anchors attached at intervals to keep it steady—in seven minutes and a half. We remember, a few years ago, when some of the Dutch and Belgic towns were being lighted with gas by our countrymen, noticing the time that was occupied in driving the mains across the canals and other waters that intervened. Gutta percha (its durability being, of course, first proved) would have obviated the difficulty.

As to the strength of gutta percha pipes, we have the evidence of the engineer to the Birmingham Waterworks that a 300 feet head of water and the "ram" caused by shutting it off suddenly produced no effect; proving their capability to withstand hydraulic pressure, whether steadily or intermittently applied. Mr. Burstall, who conducted the experiments (and his very name must have struck dismay into the piping), says, "The tubes were ¾-inch bore, the material ¼ inch thick; and, in addition to the trial already named, they were also tested by the Water Company's proving pump, with its regular load of 250 pounds to the square inch: afterwards we added weight up to 337 *pounds, and I wished to have gone to* 500, *but the lever of the valve would bear no more weight: we were unable to burst the pipe.*" The cost, as we understood, is at present about the same as lead, but then expense is saved by the absence of joints.

It may be well to mention that where pipes or other articles made of gutta percha are exposed to the direct rays of the sun, they should be painted *white*, as this effectually, it is said, prevents the material from softening. The youngest of our readers of course knows why.

At the Lambeth Gutta Percha Works, where the same processes are seen in operation, they adopt for pipes, &c. what they call Double Compound, containing, apparently, India-rubber mixed with the gutta percha, and this produces a more flexible article, and if proved to be equally strong and lasting (of which there seems little doubt), will come largely into use. Small tubes of this compound are very well suited for all gas-work where flexibility is required, and for publicans' use, to attach by union joints the beer cask with the drawing machine: a pipe of half an inch bore is found to be very useful in many places, the connections being made in about a minute.

At the works in the City-road we noticed, amongst the objects moulded, batteries, formed with all their divisions in *one piece*. To produce this, of course immense pressure is required,—as much as 150 tons. Here, too, we saw the mode adopted for testing the covered wires: the wires, we should say, receive two coatings, so that, should any impurity occur in the first operation, the evil it would cause may be obviated by the second. Made into lengths of about 1,000 yards each, these are suspended in water for a certain time, and are then temporarily connected, to the extent of 40 or 50 miles, through which the current from a powerful battery is made to pass and discharge a gun. It was passed through 60 miles when we were there, without the slightest perceptible interval of time.

Let what we have said suffice to show the importance we attach to the introduction of this material, the application of which, we feel satisfied, is but in its infancy, and will pave the way, as every fresh discovery does, for further advances and improvements. We owe it much for what it has already done. But for our knowledge of gutta percha, the extension across seas of the electric telegraph, which is now tying together all parts of the world, might have long remained an unrealised possibility. And then, following the progress only one step farther, who shall venture to say to what the telegraph will lead?

* Report of Jury, Class xxviii. Great Exhibition.

* Quoted in Tomlinson's "Cyclopædia of Useful Arts."

THE OPEN SEWERS OF BROMPTON.—It is discreditable that in such a neighbourhood as Kensington and Brompton open sewers should still be allowed to spread their injurious gases and bad odours in the few green lanes which connect the two quarters.

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